

[FIG. 1]

2      CLIENT COMPUTER  
3      NETWORK  
1      SERVER

[FIG. 2]

DISPLAY/INPUT DEVICE

TO NETWORK

4b     MEMORY  
4c     COMMUNICATION DEVICE  
4      BODY  
7      STORAGE DEVICE  
8      RECORDING MEDIUM

[FIG. 3]

15 ORGANIZATION AND INDIVIDUAL DATABASE  
13 EXPERIENCE-KNOWLEDGE PROCESSING PORTION  
13a KNOWLEDGE ANALYSIS PORTION  
13b KNOWLEDGE RELATION DISPLAY PROCESSING PORTION  
12 EXPERIENCE-KNOWLEDGE DATABASE  
14 DICTIONARY DATABASE  
16 OUTPUT DEVICE  
17 LOG DATABASE  
11 DATA COLLECTION UNIT  
10 WEB SERVER

[FIG. 4]

ORGANIZATION INFORMATION

ORGANIZATION ID

ORGANIZATION NAME

ORGANIZATION TYPE

PERIOD

HOST ORGANIZATION

[FIG. 5]

INDIVIDUAL INFORMATION

PERSONAL ID

PERSONAL NAME

ORGANIZATION ID

PERIOD

[FIG. 6]

EXPERIENCE-KNOWLEDGE SURVEY RESULT

RESPONSE ID

RESPONDENT ID (PERSONAL ID)

PAST IMPORTANT EXPERIENCE

EXPERIENCE JOB CATEGORY

ACQUIRED EXPERIENCE-KNOWLEDGE

INFLUENCED INDIVIDUAL ID OR ORGANIZATION ID

EXPERIENCE PERIOD

PROBLEM.

SITUATION .

APPLICATION CASE

MEANS

APPLICATION TARGET

REASON

RESULT

APPLICATION JOB CATEGORY

APPLICATION PERIOD

RESPONSE DATE AND TIME

[FIG. 7]

EXPERIENCE-KNOWLEDGE EXTRACTION RESULT

KNOWLEDGE ID

EXPERIENCE-KNOWLEDGE NAME

RESPONSE ID

KNOWLEDGE CREATION PROCESS

BUSINESS EXPERIENCE

SUCCESS/FAILURE FLAG

BUSINESS APPLICATION

APPLICATION TARGET

[FIG. 8]

A. PLEASE TELL US ABOUT YOUR PAST BUSINESS EXPERIENCE WHICH IS USEFUL IN YOUR CURRENT BUSINESS PERFORMANCE. EXAMPLE: SINCE I DID NOT KNOW NEEDS OF CUSTOMERS, SALES FIGURES COULD NOT INCREASE. MY SUPERIOR SENIOR SHOWED ME A SAMPLE AND WENT THROUGH OJT ONCE. AS A RESULT, I COULD LEARN THE SKILL TO CATCH NEEDS OF PATRONS AND MY SALES PERFORMANCE WAS IMPROVED.

B PLEASE TELL US YOUR JOB AND DEPARTMENT YOU BELONGED TO AT THAT TIME.

● SALES    ○ SE    ○ SERVICE    ○ SALES MANAGEMENT AND CONTRACT    ○ R&D    ○ TECHNOLOGY    ○ MANUFACTURING    ○ STAFF, ETC.

C PLEASE SELECT ONE CLOSEST TO THE DEPARTMENT YOU BELONGED TO AT THAT TIME.

(DEPARTMENT A, DEPARTMENT B, DEPARTMENT X, CENTER D)

D PLEASE WRITE THE PERIOD OF EXPERIENCE.

E PLEASE TELL US WHAT YOU LEARNED FROM THE EXPERIENCE. EXAMPLE: FOR A PERSON WHO DOES NOT KNOW NEEDS OF PATRONS WELL, IT WILL BE BETTER TO HAVE ACTIVITY TOGETHER WITH A SUPERIOR PERSON SO AS TO GAIN HIS/HER KNOW-HOW FOR SALES.

F PLEASE GIVE US DETAILS ABOUT HOW YOU ARE MAKING USE OF THE EXPERIENCE IN YOUR CURRENT BUSINESS.

EXAMPLE: WHEN A SALESMAN WORKING UNDER ME LOOKS INCAPABLE

OF APPROACHING KEY CUSTOMERS, I ORDER THE SALESMAN TO  
GO ALONG WITH THE SALESMAN WHO IS THE BEST IN MY SECTION.  
G PLEASE TELL US WHY THE EXPERIENCE IS USEFUL IN YOUR  
CURRENT BUSINESS.

EXAMPLE: MY STAFFS ARE IMPROVED IN SKILL OF SALES SO THAT  
THEY CAN ACT WITH ASSURANCE, WITH THE RESULT THAT THE  
SALES PERFORMANCE IN MY SECTION AS A WHOLE CAN BE IMPROVED.

[FIG. 9]

ACTIVITY DICTIONARY CONFIGURATION

BUSINESS ACTIVITY ID

ACTIVITY NAME

ACTIVITY DEFINITION WORD SET

UPPER ACTIVITY ID

[FIG. 10]

ACTIVITY DEFINITION WORD SET CONFIGURATION

PREDICATE VERB

PREDICATE MODIFIER

OBJECTIVE NOUN

OBJECTIVE NOUN MODIFIER

SUBJECTIVESUBJECTIVE NOUN

SUBJECTIVESUBJECTIVE NOUN MODIFIER

[FIG. 11]

UPPER AND LOWER RELATIONS BETWEEN ACTIVITIES

ACQUIRE    SPECIFY OWN NEEDS

SEARCH SUPPLIERS

ORDER

MAKE        MANUFACTURE

INSPECT

PROVIDE    SPECIFY CUSTOMERS

CATCH CUSTOMERS' NEEDS

ADVERTISE

RECEIVE ORDERS

DESIGN     SPECIFY REQUESTS OR NEEDS

DECIDE SPECIFICATIONS

DEVELOP FUNCTIONS OF PRODUCT OR SERVICE

DEVELOP PROCESSES

MANAGE     DO STRATEGIC ACTIVITY

MANAGE INTERNAL RESOURCES

MANAGE HUMAN RESOURCES

MANAGE TECHNOLOGY

MANAGE EXTERNAL RESOURCES

MANAGE LEARNING



[FIG. 12]

ACTIVITY DICTIONARY CONFIGURATION

KNOWLEDGE PROCESS ID

KNOWLEDGE PROCESS DEFINITION WORD SET

CATEGORY

[FIG. 13]

KNOWLEDGE PROCESS DEFINITION WORD SET CONFIGURATION

MEANS PREDICATE

MEANS PREDICATE MODIFIER

MEANS OBJECTIVE NOUN

MEANS OBJECTIVE NOUN MODIFIER

MEANS SUBJECTIVESUBJECTIVE NOUN

MEANS SUBJECTIVESUBJECTIVE NOUN MODIFIER

KNOWLEDGE CREATION ACTIVITY PREDICATE

KNOWLEDGE CREATION ACTIVITY PREDICATE MODIFIER

KNOWLEDGE CREATION ACTIVITY OBJECTIVE NOUN

KNOWLEDGE CREATION ACTIVITY OBJECTIVE NOUN MODIFIER

KNOWLEDGE CREATION ACTIVITY SUBJECTIVESUBJECTIVE NOUN

KNOWLEDGE CREATION ACTIVITY SUBJECTIVESUBJECTIVE NOUN  
MODIFIER

[FIG. 14]

SURVEY RESULT TEXT

APPLY SEMANTIC ANALYSIS USING LFG

EXTRACT F-STRUCTURE

USE CASE INFORMATION

APPLY MATCHING ANALYSIS

EXTRACT BUSINESS ACTIVITY

EXTRACT KNOWLEDGE CREATION PROCESS

BUSINESS ACTIVITY

KNOWLEDGE CREATION PROCESS

SECI MODEL, ETC.

EXPERIENCE KNOWLEDGE DATABASE

ACTIVITY DICTIONARY, KNOWLEDGE PROCESS DICTIONARY

EXAMPLE: IT IS COMPOSED OF VERBS, OBJECTS, NOUN MODIFIERS,  
ETC.

"MANAGE FUTURE ORGANIZATION" IS REGISTERED AS "MANAGE"  
(VERB), "ORGANIZATION" (OBJECT) AND "FUTURE" (NOUN  
MODIFIER).

THESAURUS DB, PROPER NOUN DICTIONARY, IN-HOUSE THESAURUS

EXAMPLE: PATRON      SYNONYM      CUSTOMER

NARROW-SENSE WORD      CUSTOM, CLIENT

[FIG. 15]

"PAST IMPORTANT EXPERIENCE" TEXT

- S1     PERFORM SEMANTIC ANALYSIS
- S2     PERFORM PREDICATE VERB MATCHING
- S3     IS THERE ANY MATCHING PIECE?
- S4     IS THE NUMBER OF MATCHING PIECES ONE?
- S5     IS THE NUMBER OF MATCHING PIECES EQUAL TO OR SMALLER  
THAN DESIGNATED NUMBER?
- S6     PERFORM OBJECTIVE NOUN MATCHING
- S7     CONFIRM MATCHING
- S8     PERFORM OBJECTIVE NOUN MODIFIER MATCHING
- S9     CONFIRM MATCHING
- S10    PERFORM SUBJECTIVE NOUN MATCHING
- S11    CONFIRM MATCHING
- S12    PERFORM SUBJECTIVE NOUN MODIFIER MATCHING
  
- S13    CONFIRM MATCHING
- S14    PERFORM PREDICATE VERB MODIFIER MATCHING
- S15    CONFIRM MATCHING
- S16    REQUEST USER TO CONFIRM
- S17    REQUEST USER TO SELECT BUSINESS ACTIVITY FROM  
DICTIONARY

[FIG. 16]

ACTIVITY DEFINITION WORD SET

PREDICATE VERB	PREDICATE MODIFIER	OBJECTIVE NOUN	OBJECTIVE NOUN MODIFIER	SUBJECTIVE NOUN	SUBJECTIVE NOUN MODIFIER	UPPER ACTIVITY ID
ACQUIRE						
MAKE						
PROVIDE						
DESIGN						
MANAGE						
SPECIFY		NEEDS	OWN			1
CATCH		NEEDS	CUSTOMER			3
SPECIFY		NEEDS	(PRODUCT OR SERVICE)			4

BUSINESS ACTIVITY ID	ACTIVITY NAME
1	ACQUIRE
2	MAKE
3	PROVIDE
4	DESIGN
5	MANAGE
6	SPECIFY OWN NEEDS
7	CATCH CUSTOMER'S NEEDS
8	SPECIFY NEEDS FOR PRODUCT OR SERVICE

[FIG. 17]

ANSWER: SINCE I DID NOT KNOW NEEDS OF PATRONS, SALES  
FIGURES COULD NOT INCREASE. I ASKED MY SUPERIOR SENIOR  
TO SHOW A SAMPLE.

SYNONYM DB

SYNONYM: ACQUIRE

CATCH

UNDERSTAND

MATCHING WITH ACTIVITY DICTIONARY

"CATCH CUSTOMERS' NEEDS"

EXTRACT EXPERIENCE ACTIVITY

FIG. 18

EXPERIENCE-KNOWLEDGE

TITLE: WORK WITH CAPABLE PERSON AND STEAL SKILLS FROM  
THE CAPABLE PERSON

EXPERIENCE KNOWLEDGE: A SAMPLE SHOWN TO A SUPERIOR  
SALESMAN MAKES KNOW-HOW OR SKILLS EASY TO GRASP.

PROBLEM: SALES PERFORMANCE DOES NOT INCREASE

GROUND: IMPROVED SKILL IN SALES ENABLE ACTIVITY WITH  
CONFIDENCE

STATE: INCAPABLE OF APPROACHING KEY CUSTOMERS

RESULT: CAPABLE OF ACHIEVING QUOTA CONSTANTLY

RECYCLE CASE OR MEANS: WHEN A SALESMAN WORKING UNDER YOU  
LOOKS INCAPABLE OF APPROACHING KEY CUSTOMERS, ORDER THE  
SALESMAN TO GO ALONG WITH THE SALESMAN WHO IS THE BEST  
IN YOUR SECTION.

RELEVANT BUSINESS ACTIVITY: CATCH PATRON'S NEEDS

RELEVANT KNOWLEDGE CREATION SECI: SOCIALIZATION

PROCESS: SALES

EXPERIENCE KNOWLEDGE USE PERIOD: 1998

PAST USEFUL EXPERIENCE

USEFUL EXPERIENCE: I HAD BUSINESS ACTIVITIES WITH MY  
SENIOR MR. A, AND LEARNED SKILLS TO CATCH CUSTOMERS' NEEDS,  
SO THAT I COULD INTRODUCE A PRODUCT TO COMPANY X OUR COMPANY  
HAD NEVER MADE A DELIVERY TO.

USEFUL BUSINESS ACTIVITY: CATCH CUSTOMERS' NEEDS



JOB CATEGORY AT THE TIME OF EXPERIENCE: SALES

EXPERIENCE PERIOD: 1995

RESPONDENT

RESPONDENT: GORO AKASAKA

RESPONSE DATE: MARCH 3, 2001

[FIG. 19]

EXPERIENCE KNOWLEDGE PROPAGATION GRAPH

EXPERIENCE KNOWLEDGE 1 ONE YEAR EXPERIENCE KNOWLEDGE

2 TWO YEARS EXPERIENCE KNOWLEDGE 3 0.5 YEARS

EXPERIENCE KNOWLEDGE 4

EXPERIENCE KNOWLEDGE 5 THREE YEARS EXPERIENCE

KNOWLEDGE 6

[FIG. 20]

EXPERIENCE KNOWLEDGE PROPAGATION VELOCITY COMPARISON  
TABLE

COMPANY NAME	ORGANIZATION NAME	EXPERIENCE KNOWLEDGE PROPAGATION VELOCITY
COMPANY X	DEPARTMENT A	0.3
	DEPARTMENT B	0.789756
	DEPARTMENT C	1.3456
	DEPARTMENT D	0.976
	AVERAGE	0.852839
COMPANY Y	SECTION 2	1.1
	SECTION 3	0.25
	SECTION 4	1.2
	AVERAGE	0.85

[FIG. 21]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH BUSINESS ACTIVITIES  
AND KNOWLEDGE CREATION PROCESSES (SECI MODEL)

KNOWLEDGE CREATION PROCESS BUSINESS ACTIVITY			SECI				
			S <sup>1)</sup>	E <sup>2)</sup>	C <sup>3)</sup>	I <sup>4)</sup>	TOTAL
PRACTICE	GET	SPECIFY OWN NEEDS					1/0
		SEARCH SUPPLIERS					0/0
		SELECT SUPPLIERS					0/0
		ORDER					0/0
		ACCEPT					0/0
		PAY					0/0
		MANAGE SUPPLIERS					0/0
		TOTAL	0/0	1/0	0/0	0/0	1/0
	MAKE	MANUFACTURE		0/4	3/1		3/5
		MANUFACTURE BY TRIAL					0/0
		TOTAL	0/0	0/4	3/1	0/0	3/5
	PROVIDE	SPECIFY CUSTOMERS		1/0			1/0
		CATCH CUSTOMERS' NEEDS	2/1		1/2	2/1	5/4
		ADVERTISE TO CUSTOMERS					0/0
		ACCEPT ORDERS					0/0
		PROVIDE PRODUCTS OR SERVICE					0/0
		RECEIVE PAYMENT					0/0
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS			3/4		3/4
		TOTAL	2/1	1/0	4/6	2/1	9/8
	DESIGN	SPECIFY NEEDS OR REQUESTS		1/0			1/0
		SPECIFY FUNCTIONAL SPECIFICATIONS					0/0
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1/2				1/2
		DEVELOP PROCESSES					0/0
		TOTAL	1/2	1/0	0/0	0/0	2/2
	TOTAL OF PIECES OF RECYCLE KNOWLEDGE FOR PRACTICE		3/3	2/4	8/7	2/1	15/15
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1/0				1/0
		EXECUTE STRATEGY		2/0			2/0
		TOTAL	1/0	0/2	0/0	0/0	1/2
	INTERNAL RESOURCES	MANAGE OVERALL INTERNAL RESOURCES	0/1				0/1
		MANAGE FINANCE					0/0
		MANAGE ARTICLES	1/0				1/0
		MANAGE HUMAN RESOURCES					0/0
		MANAGE INFORMATION		1/0			1/0
		MANAGE TECHNOLOGY				1/2	1/2
		MANAGE ORGANIZATION OR PROJECT	0/1				0/1
		TOTAL	1/2	1/0	0/0	1/2	3/4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE		1/0	2/0		3/0
		MANAGE STAKEHOLDERS			1/0	1/1	2/1
		MANAGE ENVIRONMENTAL ISSUES					0/0
		MANAGE SOCIAL ISSUES		1/0			1/0
		MANAGE COMPETITION ISSUES			1/2	2/2	3/4
		MANAGE REGULATION ISSUES					0/0

		TOTAL	0/0	2/0	4/2	3/3	9/5
	CHANGE	MANAGE LEARNING AND CHANGE		1/1		0/2	1/3
		TOTAL	0/0	1/1	0/0	0/2	1/3
		TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT	2/2	4/3	4/2	4/7	14/14
TOTAL OF RECYCLE KNOWLEDGE			5/5	6/7	12/9	6/8	29/29

NOTE: 1) S IS AN ABBREVIATION OF SOCIALIZATION.

2) E IS AN ABBREVIATION OF EXTERNALIZATION.

3) C IS AN ABBREVIATION OF COMBINATION.

4) I IS AN ABBREVIATION OF INTERNALIZATION.

[FIG. 22]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH BUSINESS ACTIVITIES  
AND KNOWLEDGE CREATION PROCESSES (SECI MODEL)

KNOWLEDGE CREATION PROCESS BUSINESS ACTIVITY			SECI									
			S <sup>1)</sup>		E <sup>2)</sup>		C <sup>3)</sup>		I <sup>4)</sup>		TOTAL	
PRACTICE	GET	SPECIFY OWN NEEDS					1		1		1	0
		SEARCH SUPPLIERS									0	0
		SELECT SUPPLIERS									0	0
		ORDER									0	0
		ACCEPT									0	0
		PAY									0	0
		MANAGE SUPPLIERS									0	0
		TOTAL	0	0	0	0	1	0	0	0	1	0
	MAKE	MANUFACTURE				4	3	1			3	5
		MANUFACTURE BY TRIAL									0	0
		TOTAL	0	0	0	4	3	1	0	0	3	5
	PROVIDE	SPECIFY CUSTOMERS			1	0					1	0
		CATCH CUSTOMERS' NEEDS	2	1			1	2	2	1	5	4
		ADVERTISE TO CUSTOMERS									0	0
		ACCEPT ORDERS									0	0
		PROVIDE PRODUCTS OR SERVICE									0	0
		RECEIVE PAYMENT									0	0
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS					3	4			3	4
		TOTAL	2	1	1	0	4	6	2	1	9	8
	DESIGN	SPECIFY NEEDS OR REQUESTS			1	0					1	0
		SPECIFY FUNCTIONAL SPECIFICATIONS									0	0
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1	2							1	2
		DEVELOP PROCESSES									0	0
		TOTAL	1	2	1	0	0	0			2	2
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE		3	3	2	4	8	7			15	15
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1								0	0
		EXECUTE STRATEGY			0	2					0	2
		TOTAL	1	0	0	2	0	0	0	0	1	2
	INTERNAL RESOURCES	OVERALL PERSPECTIVE		1							0	1
		MANAGE FINANCE									0	0
		MANAGE ARTICLES	1								1	0
		MANAGE HUMAN RESOURCES									0	0
		MANAGE INFORMATION			1						1	0
		MANAGE TECHNOLOGY						1	2		1	2
		MANAGE ORGANIZATION OR PROJECT		1							0	1
		TOTAL	1	2	1	0	0	0	1	2	3	4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE			1		2				3	0
		MANAGE STAKEHOLDERS				1		1	1		2	1
		MANAGE ENVIRONMENTAL ISSUES									0	0
		MANAGE SOCIAL ISSUES			1						1	0
		MANAGE COMPETITION ISSUES					1	2	2	2	3	4
		MANAGE REGULATION ISSUES									0	0
		TOTAL	0	0	2	0	4	2	3	3	9	5

	CHANGE	MANAGE LEARNING AND CHANGE			1	1			0	2	1	3
	TOTAL		0	0	1	1	0	0	0	2	1	3
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT		2	1	4	3	4	2	4	7	14	14
TOTAL OF RECYCLE KNOWLEDGE			5	5	6	7	12	9	6	8	29	29

NOTE: 1) S IS AN ABBREVIATION OF SOCIALIZATION.

2) E IS AN ABBREVIATION OF EXTERNALIZATION.

3) C IS AN ABBREVIATION OF COMBINATION.

4) I IS AN ABBREVIATION OF INTERNALIZATION.

[FIG. 23]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH BUSINESS ACTIVITIES  
AND JOB CATEGORIES

KNOWLEDGE CREATION PROCESS BUSINESS ACTIVITY			I <sup>1)</sup>		II <sup>2)</sup>		III <sup>3)</sup>		IV <sup>4)</sup>		V <sup>5)</sup>	
PRACTICE	GET	SPECIFY OWN NEEDS					1		1		1	
		SEARCH SUPPLIERS										
		SELECT SUPPLIERS										
		ORDER										
		ACCEPT										
		PAY										
		MANAGE SUPPLIERS										
		TOTAL	0	0	0	0	1	0	0	0	1	0
	MAKE	MANUFACTURE				4	3	1			3	5
		MANUFACTURE BY TRIAL										
		TOTAL	0	0	0	4	3	1	0	0	3	5
	PROVIDE	SPECIFY CUSTOMERS			1						1	
		CATCH CUSTOMER' NEEDS	2	1			1	2	2	1		4
		ADVERTISE TO CUSTOMERS										
		ACCEPT ORDERS										
		PROVIDE PRODUCTS OR SERVICE										
		RECEIVE PAYMENT										
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS					3	4			3	
		TOTAL	2	1	1	0	4	6	2	1	4	4
	DESIGN	SPECIFY NEEDS OR REQUESTS			1						1	
		SPECIFY FUNCTIONAL SPECIFICATIONS										
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1	2							1	
		DEVELOP PROCESSES										
		TOTAL	1	2	1	0	0	0			2	2
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE		3	3	2	4	8	7			15	15
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1									
		EXECUTE STRATEGY			0	2						2
		TOTAL	1	0	0	2	0	0	0	0	1	2
	INTERNAL RESOURCES	OVERALL PERSPECTIVE		1								1
		MANAGE FINANCE										
		MANAGE ARTICLES	1								1	
		MANAGE HUMAN RESOURCES										
		MANAGE INFORMATION			1						1	
		MANAGE TECHNOLOGY							1	2	1	2
		MANAGE ORGANIZATION OR PROJECT		1								1
		TOTAL	1	2	1	0	0	0	1	2	3	4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE			1		2				3	
		MANAGE STAKEHOLDERS					1		1	1	2	1
		MANAGE ENVIRONMENTAL ISSUES										
		MANAGE SOCIAL ISSUES			1						1	
		MANAGE COMPETITION ISSUES					1	2	2	2	3	4
		MANAGE REGULATION ISSUES										
		TOTAL	0	0	2	0	4	2	3	3	9	5
	CHANGE	MANAGE LEARNING AND CHANGE			1	1				2	1	3
		TOTAL	0	0	1	1	0	0	0	2	1	3

	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT	2	1	4	3	4	2	4	7	14	14
	TOTAL OF RECYCLE KNOWLEDGE	5	5	6	7	12	9	6	8	29	29

NOTE: 1) I MEANS SALES (INCLUDING SP).

2) II MEANS SE.

3) III MEANS SERVICE.

4) IV MEANS SALES MANAGEMENT AND CONTRACT.

5) V MEANS R&D.

KNOWLEDGE CREATION PROCESS BUSINESS ACTIVITY			VI <sup>6)</sup>		VII <sup>7)</sup>		TOTAL	
PRACTICE	GET	SPECIFY OWN NEEDS			1		4	0
		SEARCH SUPPLIERS					0	0
		SELECT SUPPLIERS					0	0
		ORDER					0	0
		ACCEPT					0	0
		PAY					0	0
		MANAGE SUPPLIERS					0	0
		TOTAL	0	0	1	0	4	0
	MAKE	MANUFACTURE	3	5			9	15
		MANUFACTURE BY TRIAL					0	0
		TOTAL					9	15
	PROVIDE	SPECIFY CUSTOMERS	1				2	0
		CATCH CUSTOMERS' NEEDS	2	1	3	2	5	8
		ADVERTISE TO CUSTOMERS					0	0
		ACCEPT ORDERS					0	0
		PROVIDE PRODUCTS OR SERVICE					0	0
		RECEIVE PAYMENT					0	0
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS	1	1	2	3	6	4
		TOTAL	4	2	5	6	13	12
	DESIGN	SPECIFY NEEDS OR REQUESTS	1				1	0
		SPECIFY FUNCTIONAL SPECIFICATIONS					0	0
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1			2	1	4
		DEVELOP PROCESSES					0	0
		TOTAL	2	0	0	2	2	2
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE		9	7	6	8	14	14
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1				1	0
		EXECUTE STRATEGY					0	2
		TOTAL	1	0	0	0	1	2
	INTERNAL RESOURCES	OVERALL PERSPECTIVE				1	0	1
		MANAGE FINANCE					0	0
		MANAGE ARTICLES					1	0
		MANAGE HUMAN RESOURCES					0	0
		MANAGE INFORMATION			1		1	0
		MANAGE TECHNOLOGY	1	1		1	1	2
		MANAGE ORGANIZATION OR PROJECT					0	0



		TOTAL	2	1	1	3	3	4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE	2		1		3	0
		MANAGE STAKEHOLDERS			2	1	2	1
		MANAGE ENVIRONMENTAL ISSUES					0	0
		MANAGE SOCIAL ISSUES			1		1	0
		MANAGE COMPETITION ISSUES	3	3		1	3	4
		MANAGE REGULATION ISSUES					0	0
		TOTAL	5	3	4	2	9	5
	CHANGE	MANAGE LEARNING AND CHANGE	1	2		1	1	3
		TOTAL	1	2	0	1	1	3
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT		9	6	5	6	14	14
	TOTAL OF RECYCLE KNOWLEDGE		18	13	11	16	29	29

NOTE: 1) VI MEANS TECHNOLOGY.

2) VII MEANS STAFF ETC.

[FIG. 24]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH JOB CATEGORIES AND  
KNOWLEDGE CREATION PROCESSES (SECI MODEL)

KNOWLEDGE CREATION PROCESS JOB CATEGORY	SECI									
	S <sup>1)</sup>		E <sup>2)</sup>		C <sup>3)</sup>		I <sup>4)</sup>		TOTAL	
SALES (INCLUDING SP)					1		1		2	0
SE									0	0
SERVICE									0	0
SALES MANAGEMENT AND CONTRACT									0	0
R&D									0	0
MANUFACTURING									0	0
TECHNOLOGY									0	0
STAFF ETC.				4	3	1			3	5
TOTAL OF RECYCLE KNOWLEDGE	5	5	6	7	12	9	6	8	29	29

NOTE: 1) S IS AN ABBREVIATION OF SOCIALIZATION.

2) E IS AN ABBREVIATION OF EXTERNALIZATION.

3) C IS AN ABBREVIATION OF COMBINATION.

4) I IS AN ABBREVIATION OF INTERNALIZATION.

[FIG. 25]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH BUSINESS ACTIVITIES  
AND EXPERIENCE PERIODS

YEAR BUSINESS ACTIVITY			-1990		1991- 1995		1996-97		1998-99		2000	
PRACTICE	GET	SPECIFY OWN NEEDS					1		1		1	
		SEARCH SUPPLIERS										
		SELECT SUPPLIERS										
		ORDER										
		ACCEPT										
		PAY										
		MANAGE SUPPLIERS										
		TOTAL	0	0	0	0	1	0	0	0	1	0
	MAKE	MANUFACTURE				4	3	1			3	5
		MANUFACTURE BY TRIAL										
		TOTAL	0	0	0	4	3	1	0	0	3	5
	PROVIDE	SPECIFY CUSTOMERS			1						1	
		CATCH CUSTOMERS' NEEDS	2	1			1	2	2	1		4
		ADVERTISE TO CUSTOMERS										
		ACCEPT ORDERS										
		PROVIDE PRODUCTS OR SERVICE										
		RECEIVE PAYMENT										
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS					3	4			3	
		TOTAL	2	1	1	0	4	6	2	1	4	4
	DESIGN	SPECIFY NEEDS OR REQUESTS			1						1	
		SPECIFY FUNCTIONAL SPECIFICATIONS										
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1	2							1	
		DEVELOP PROCESSES										
		TOTAL	1	2	1	0	0	0			2	2
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE		3	3	2	4	8	7			15	15
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1									
		EXECUTE STRATEGY			0	2						2
		TOTAL	1	0	0	2	0	0	0	0	1	2
	INTERNAL RESOURCES	OVERALL PERSPECTIVE		1								1
		MANAGE FINANCE										
		MANAGE ARTICLES	1								1	
		MANAGE HUMAN RESOURCES										
		MANAGE INFORMATION			1						1	
		MANAGE TECHNOLOGY						1	2		1	2
		MANAGE ORGANIZATION OR PROJECT		1								1
		TOTAL	1	2	1	0	0	0	1	2	3	4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE			1		2				3	

		MANAGE STAKEHOLDERS					1		1	1	2	1
		MANAGE ENVIRONMENTAL ISSUES										
		MANAGE SOCIAL ISSUES			1						1	
		MANAGE COMPETITION ISSUES					1	2	2	2	3	4
		MANAGE REGULATION ISSUES										
		TOTAL	0	0	2	0	4	2	3	3	9	5
	CHANGE	MANAGE LEARNING AND CHANGE			1	1				2	1	3
		TOTAL	0	0	1	1	0	0	0	2	1	3
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT		2	1	4	3	4	2	4	7	14	14
	TOTAL OF RECYCLE KNOWLEDGE		5	5	6	7	12	9	6	8	29	29

YEAR BUSINESS ACTIVITY			2001		2002		TOTAL	
PRACTICE	GET	SPECIFY OWN NEEDS			1		4	0
		SEARCH SUPPLIERS					0	0
		SELECT SUPPLIERS					0	0
		ORDER					0	0
		ACCEPT					0	0
		PAY					0	0
		MANAGE SUPPLIERS					0	0
		TOTAL	0	0	1	0	4	0
	MAKE	MANUFACTURE	3	5			9	15
		MANUFACTURE BY TRIAL					0	0
		TOTAL					9	15
	PROVIDE	SPECIFY CUSTOMERS	1				2	0
		CATCH CUSTOMERS' NEEDS	2	1	3	3	5	8
		ADVERTISE TO CUSTOMERS					0	0
		ACCEPT ORDERS					0	0
		PROVIDE PRODUCTS OR SERVICE					0	0
		RECEIVE PAYMENT					0	0
		KEEP GOOD RELATIONSHIP WITH CUSTOMERS	1	1	2	3	6	4
		TOTAL	4	2	5	6	13	12
	DESIGN	SPECIFY NEEDS OR REQUESTS	1				1	0
		SPECIFY FUNCTIONAL SPECIFICATIONS					0	0
		DEVELOP FUNCTIONS OF PRODUCT OR SERVICE	1			2	1	4
		DEVELOP PROCESSES					0	0
		TOTAL	2	0	0	2	2	2
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE		9	7	6	8	14	14
MANAGE PRACTICE	STRATEGY	CREATE STRATEGY	1				1	0
		EXECUTE STRATEGY					0	2
		TOTAL	1	0	0	0	1	2
	INTERNAL RESOURCES	OVERALL PERSPECTIVE				1	0	1
		MANAGE FINANCE					0	0
		MANAGE ARTICLES					1	0

		MANAGE HUMAN RESOURCES					0	0
		MANAGE INFORMATION			1		1	0
		MANAGE TECHNOLOGY	1	1		1	1	2
		MANAGE ORGANIZATION OR PROJECT					0	0
		TOTAL	2	1	1	3	3	4
	EXTERNAL RESOURCES	OVERALL PERSPECTIVE	2		1		3	0
		MANAGE STAKEHOLDERS			2	1	2	1
		MANAGE ENVIRONMENTAL ISSUES					0	0
		MANAGE SOCIAL ISSUES			1		1	0
		MANAGE COMPETITION ISSUES	3	3		1	3	4
		MANAGE REGULATION ISSUES					0	0
		TOTAL	5	3	4	2	9	5
	CHANGE	MANAGE LEARNING AND CHANGE	1	2		1	1	3
		TOTAL	1	2	0	1	1	3
	TOTAL OF RECYCLE KNOWLEDGE FOR PRACTICE MANAGEMENT		9	6	5	6	14	14
	TOTAL OF RECYCLE KNOWLEDGE		18	13	11	16	29	29

[FIG. 26]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH JOB CATEGORIES AND  
EXPERIENCE PERIODS

YEAR	-1990		1991-1995		1996-97		1998-99		2000		2001		2002		TOTAL	
SALES (INCLUDING SP)					1		1				1		1		2	0
SE															0	0
SERVICE															0	0
SALES MANAGEMENT AND CONTRACT															0	0
R&D															0	0
MANUFACTURING															0	0
TECHNOLOGY															0	0
STAFF ETC.				4	3	1			4	3	1				3	5
TOTAL OF RECYCLE KNOWLEDGE	5	5	6	7	12	9	6	8	6	7	12	9	6	8	29	29

[FIG. 27]

EXPERIENCE KNOWLEDGE RECYCLE MAP WITH KNOWLEDGE CREATION  
PROCESSES (SECI) AND EXPERIENCE PERIODS

YEAR	-1990		1991-1995		1996-97		1998-99		2000		2001		2002		TOTAL	
SOCIALIZATION					1		1				1		1		2	0
EXTERNALIZATION															0	0
COMBINATION															0	0
EXTERNALIZATION															0	0
TOTAL OF RECYCLE KNOWLEDGE	5	5	6	7	12	9	6	8	6	7	12	9	6	8	29	29

[FIG. 28]

VERB PHRASE SYNONYMOUS RULE:

IF PREDICATE VERB SYNONYMOUS WITH ACTIVITY EXPRESSING  
PHRASE IN ACTIVITY DICTIONARY IS IN RESPONSE TEXT

IF PREDICATE VERB MODIFIER IS IN THE ACTIVITY EXPRESSING  
PHRASE

IF APPLY NOUN SYNONYMOUS RULE TO DETERMINE SYNONYMOUS

THEN DETERMINE SYNONYMOUS

ELSE DETERMINE SYNONYMOUS

NOUN PHRASE SYNONYMOUS RULE:

IF EXTRACT NOUN PHRASE IN WHICH PREDICATE RELATION IS  
THE SAME (SUBJECTIVE MODIFIER NOUN AND OBJECTIVE MODIFIER  
NOUN ETC.)

IF SYNONYMOUS NOUN WITH NOUN IN ACTIVITY EXPRESSING  
PHRASE IN ACTIVITY DICTIONARY IS IN RESPONSE TEXT

THEN DETERMINE SYNONYMOUS

(1) RESPONSE TEXT: I CANNOT CATCH PATRON'S NEEDS.

ACTIVITY EXPRESSING PHRASE IN ACTIVITY DICTIONARY: GRASP  
CUSTOMER'S NEEDS

RESULT OF ANALYSIS OF SYNONYMOUS TEXT

PREDICATE: CATCH (VERB)

OBJECTIVE NOUN: NEEDS

OBJECTIVE MODIFIER: PATRON

ACTIVITY DICTIONARY CONFIGURATION

PREDICATE VERB: GRASP



OBJECTIVE NOUN: NEEDS

OBJECTIVE MODIFIER: CUSTOMER

SINCE "CATCH" AND "GRASP" ARE DEFINED SYNONYMOUS IN  
THESAURUS DB, VERB PHRASE SYNONYMOUS RULE CAN BE APPLIED  
AS PREDICATE VERB MODIFIER IS NOT FOUND, DETERMINE  
SYNONYMOUS IN VERB PHRASE LEVEL

SINCE THESE "NEEDS" CORRESPOND, OBJECTIVE MODIFIER OF  
"NEEDS" IS COMPARED BY NOUN PHRASE SYNONYMOUS RULE  
AS "PATRON" AND "CUSTOMER" ARE DEFINED SYNONYMOUS IN  
THESAURUS DB, DETERMINE SYNONYMOUS IN NOUN PHRASE LEVEL

#### PARAGRAPH SYNONYMOUS RULE

IF SYNONYMOUS BY VERB PHRASE SYNONYMOUS RULE

IF SUBJECTIVE IS NOUN SYNONYMOUS WITH NOUN CONTAINED  
IN OBJECTIVE (OBJECTIVE NOUN) OF ACTIVITY EXPRESSION IN  
ACTIVITY DICTIONARY

THEN REGARD SYNONYMOUS NOUN AS OBJECTIVE, GENERATE  
REPHRASE, APPLY VERB PHRASE SYNONYMOUS RULE;

APPLY NOUN PHRASE SYNONYMOUS RULE TO OBJECTIVE

(2) RESPONSE TEXT: I CANNOT CATCH PATRON'S NEEDS.  
ACTIVITY EXPRESSING PHRASE IN ACTIVITY DICTIONARY: GRASP  
CUSTOMER'S NEEDS

RESULT OF ANALYSIS OF SYNONYMOUS TEXT

PREDICATE: CATCH (VERB)

OBJECTIVE NOUN: NEEDS

OBJECTIVE MODIFIER: PATRON

ACTIVITY DICTIONARY CONFIGURATION

PREDICATE VERB: GRASP

OBJECTIVE NOUN: NEEDS

OBJECTIVE MODIFIER: CUSTOMER

SINCE THESE "NEEDS" CORRESPOND, APPLY PARAGRAPH

SYNONYMOUS RULE, THEN CONDUCT PROCEDURE (1)

[FIG. 29]

S21 INPUT RESPONSE TEXT TO QUESTION C

S22 PROBLEM: APPLY EXPERIENCE KNOWLEDGE SEPARATION RULE

S25 INPUT RESPONSE TEXT TO QUESTION D

S26 APPLY STATE/APPLICATION CASE OR MEANS SEPARATION RULE

S28 CASE?

S29 MEANS TEXT

S30 APPLICATION CASE TEXT

S31 APPLY REASON/RESULT SEPARATION RULE

S32 ONLY REASON PART?

S33 REASON PART TEXT

S23 PROBLEM DESCRIPTION TEXT

S24 EXPERIENCE KNOWLEDGE DESCRIPTION TEXT

S27 STATE TEXT

S35 APPLY APPLICATION TARGET EXTRACTION RULE

S36 DESIGNATE APPLICATION TARGET

S37 MATCH FAILURE DETERMINATION RULE?

S39 FAILURE FLAG

S38 MATCH SUCCESS DETERMINATION RULE?

S40 SUCCESS FLAG

S41 SUSPENSE FLAG

[FIG. 30]

S51 TEXT OF ITEM "EXPERIENCE KNOWLEDGE" IN SURVEY RESULT  
TABLE OF EXPERIENCE KNOWLEDGE DATABASE

S53 APPLY KNOWLEDGE CREATION ACTIVITY/MEANS ACTIVITY  
SEPARATION RULE

S54 KNOWLEDGE CREATION ACTIVITY DESCRIPTION PART

S55 MEANS DESCRIPTION PART

S54 GENERATE REPHRASE

S63 REPHRASE RULE

S56 SEMANTIC ANALYSIS

S57 PREDICATE VERB MATCHING

S59 NUMBER OF MATCHING PIECES IS ONE

S61 USER CONFIRMS

S60 NUMBER OF MATCHING PIECES IS EQUAL TO OR SMALLER THAN  
DESIGNATED NUMBER

S62 USER SELECTS FROM DICTIONARY KNOWLEDGE CREATION  
ACTIVITY OR MEANS ACTIVITY

S52 TEXT OF ITEM "APPLICATION CONTENT" IN SURVEY RESULT  
OF EXPERIENCE KNOWLEDGE DATABASE

S65 OBJECTIVE NOUN MATCHING

S66 CONFIRM MATCHING

S67 OBJECTIVE NOUN MODIFIER MATCHING

S68 CONFIRM MATCHING

S69 PREDICTIVE VERB MODIFIER MATCHING

S70 CONFIRM MATCHING

S71 SUBJECTIVE NOUN MATCHING

S72 CONFIRM MATCHING

S73 SUBJECTIVE NOUN MODIFIER MATCHING

S74 CONFIRM MATCHING

[FIG. 31]

TIME

ACTIVITY

EXPERIENCE (TACIT KNOWLEDGE)

KNOWLEDGE (EXPLICIT KNOWLEDGE)

KNOWLEDGE CREATION PROCESS (SECI)

APPLICATION

EXPERIENCE